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REPORT

of the

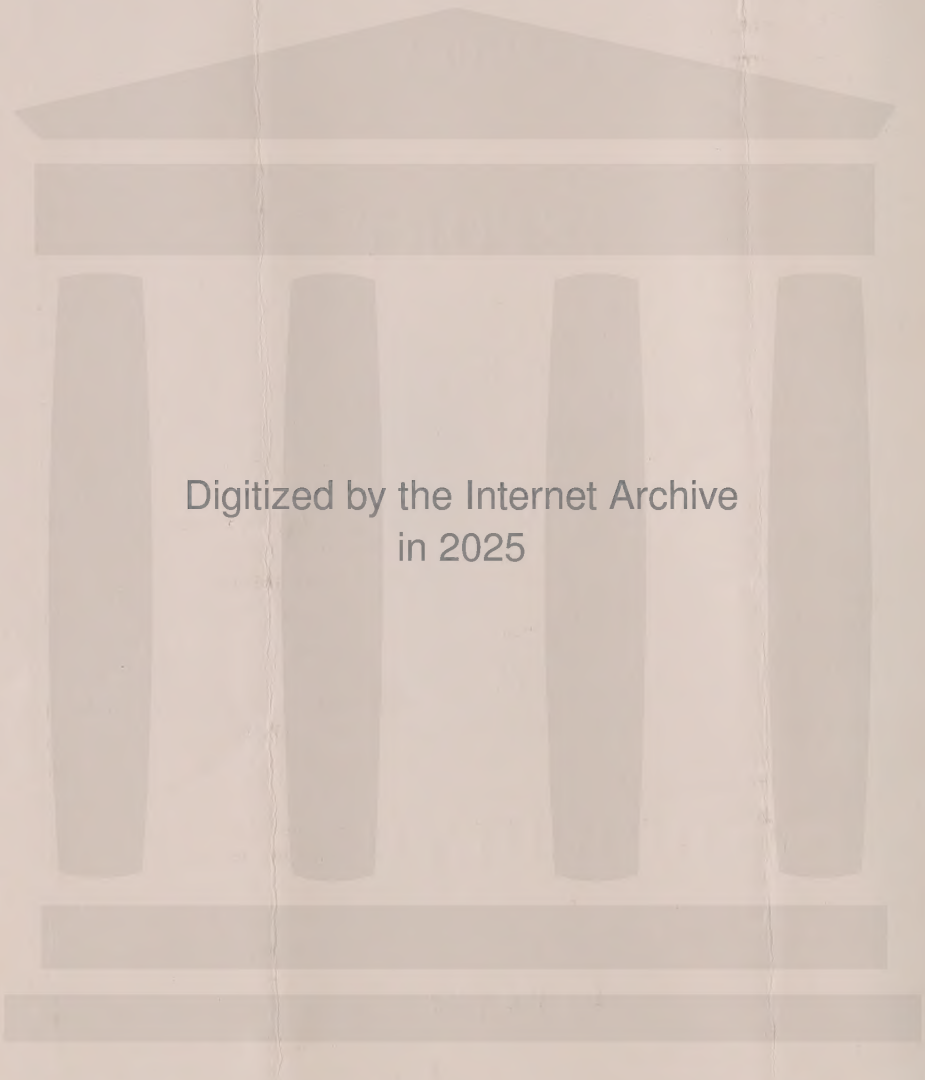
DEPARTMENT

of

AGRICULTURE

for the year

1940



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Report of Director of Agriculture, 1940.

The Chairman,
Board of Agriculture.

I. AGRICULTURE IN 1940

As the War progresses, the continued aims of Agriculture in Bermuda are firstly to expand the local production of food for the community and secondly to increase the export of produce which will earn in foreign markets the means to buy essential imports. During the year under review, progress has been made along both lines, and land is now being cultivated which has been idle for several years.

Favourable weather played a helpful part in this effort. The winter of 1939-40 was one of the stormiest on record and destructive winds blew as late as the middle of April, leaving even the evergreen trees bare and leafless. But from then on through the summer and autumn the weather was most kind, providing ample showers at frequent intervals and unusual freedom from wind. The total rainfall for the year recorded at the Agricultural Station was 53.8 inches as compared with an average of 55.8 inches for the previous ten years.

Local production supplies only a small part of the food of the community, the main articles of diet being imported. For bread and butter, sugar and much of our meat, we look to other countries. Our chief crops, potatoes and fresh vegetables, are undoubtedly being used to greater extent in the home market, but it is probably the case that many people would benefit in health by a still greater use of this produce in the diet. This however is unlikely to come about unless under some form of pressure. A certain amount of pressure is exerted by the increased prices of nearly all imported food which tend to make the price of local produce more attractive. Assistance has also been given by publicity and in particular by a series of lectures on nutrition delivered in several of the parishes by members of the Bermuda Women's Auxiliary Force, in which the value of fresh farm produce was stressed. A more direct form of pressure can be exerted by the Food and Supplies Control Board which scrutinises permits for the importation of goods. The Board has proved helpful in excluding imports of produce obtainable in the local market, but, apart from prohibiting a few luxury items, it has made no serious attempt so far to shape the diet of the people by restriction of imports.

Local produce is sold through so many different channels that it is extremely difficult to estimate the consumption. Nevertheless there were indications of improved sales in the local market and many farmers found this a profitable outlet. A large volume of produce was sold from vegetable carts travelling from house to house, and the Farmers Market also had a large turnover.

Dairying which has proved the most profitable branch of agriculture in recent years has fallen on evil days since the start of the war. In the first place, the cessation of the tourist business and general decline in income reduced the demand for fresh milk at the same time as the price of imported feed rose greatly. Dairymen had no sooner adjusted themselves to this difficulty than a worse trouble arose in the occurrence of several cases of undulant fever. From blood-tests of cattle made in recent years and recorded in these Reports it was plainly shown that Bang's Disease was generally distributed throughout the dairy cattle, but this fact had hitherto held little importance since the incidence was for the most part slight and the related human disease was very rare. During the year its diagnosis in several cases drew attention to the occurrence in cattle, and the dangers of using fresh milk were stressed, and indeed were exaggerated in statements published by the press and by salesmen of tinned milk. In order to place the milk-supply beyond reproach, the General Board of Health and the Board of Agriculture jointly recommended that all milk offered for sale be pasteurised unless the herd could be proved to be free from Bang's Disease, and byelaws to this end were drafted towards the end of the year. The Board of Agriculture further recommended that assistance be given the industry by the organisation of central pasteurisation which would be run by a co-operative of the dairymen; but this recommendation was not accepted. The adoption of the new byelaws will probably place dairying on a much safer basis, but in the meantime the sale of milk has suffered severely, and faced by loss of custom and by the necessity to find means of pasteurising, several dairymen have gone out of business.

Owing to reduced employment in other trades the labour supply on the farms was adequate for the greater part of the year. A recovery in building and other trades towards the end of the year, however, drew labour from the farms and dairymen and farmers once more raised their very familiar cry for efficient and inexpensive help.

In addition to the increased growing of vegetables as crops for sale, greater interest has been taken by householders in vegetable-growing. In the case of people with low incomes, and where this does not materially affect the sale of produce by those who depend upon it for a living, this is a very good feature which deserves to be encouraged.

The Canadian Market. Prices of some vegetables, notably onions and celery, were extraordinarily good in the Canadian market and those of cabbage and carrots were above average. Larger quantities of all these vegetables could have been sold even though in the case of carrots a greater volume was shipped than in any previous year to Canada. Shipment was made by direct sailing of Canadian National Steamships to Halifax and St. John and to Montreal, the Maritimes receiving more than two-thirds of the volume. The steamship service was not so efficient as usual owing to irregularity in the sailings and owing to the fact that it was not possible to predict or to announce the arrival of a steamship for any period in advance. As a result the time elapsing between reaping and shipment tended to be longer than usual and wastage of the perishable vegetables was correspondingly greater. Efficient pre-cooling and cold storage on the dock would have solved this difficulty.

Export of Produce. The quantities of vegetables and lily bulbs exported to various countries during 1940 are summarised in the following table.

Commodity	U.K.	Canada	B.W.I. & Br. Guiana	U.S.A.	Other Countries	Total
Beets (bushels)	—	1,796	167	—	—	1,963
Cabbage "	—	5,182	1,896	—	—	7,078
Carrots "	—	28,480	637	35	—	29,152
Celery "	—	7,970	20	414	—	8,404
Onions "	—	7,497	394	—	—	7,891
Potatoes "	154	2,314	12,414	2,835	90	17,807
Tomatoes "	—	1,922	—	—	—	1,922
Miscellaneous	—	111	191	7	—	309
Total Vegetable (bushels)	154	55,272	15,719	3,291	90	74,526
Lily Bulbs (cases)	—	141	1	1,270	8	1,420
Cut-flowers (boxes)	—	—	2	10,056	—	10,058

The total volume of vegetable exports at 74,526 bushels compares with 46,542 bushels in 1939 and represents 58% of the average quantity exported in the previous ten years. The estimated returns to Bermuda from the sale of agricultural produce (including cut-flowers) in various countries, arrived at by subtracting freight-charges and selling-costs from the gross receipts, are shown in the following table.

Country of Export	Estimated Value of Returns 1938	1939	1940
United Kingdom	£ 1,300	£ 1,100	—
Canada	12,000	8,300	£13,800
British West Indies	500	500	4,200
United States of America	9,700	9,200	7,600
Other Countries	100	—	—
	£23,600	£19,100	£25,600

Other Markets. The reduced Customs Tariff on vegetables from Bermuda entering the United States, which resulted from the Trade Agreements made by the United States with the United Kingdom and Canada in 1938, has had no appreciable effect on vegetable exports which reached a low record in 1940. Sales to the British West Indian islands improved greatly, whereas shipment to the United Kingdom was hardly possible.

The Chief Crops: Potatoes. Early plantings of the Bliss Triumph Crop in the autumn of 1939 were destroyed by the hurricane on the 16th October and many fields were replanted. The Triumph crop was accordingly late in being dug in January and February of 1940 and the second crop, of Garnet and Irish Cobbler varieties, was correspondingly late in being planted and much of it was not dug till well into May when the weather was hot. A bumper crop was dug, very large yields being taken from some fields. Like many abnormally large crops it brought less profit to the grower than an average crop. The quality was poor; there was some Phytophthora rot, and still more of a rot apparently associated with Fusarium but probably caused by the potatoes remaining too late in the hot ground. To add to these troubles attack by tuber-moth rapidly set in. Neither in the Canadian nor in the New York market was there any chance

of selling profitably and growers had on their hands a crop which was wasting rapidly and which could not be wholly consumed in the local market for several months. Fortunately the Department had been exploring the possibilities of selling potatoes in Trinidad and when the situation became acute an arrangement was completed by which the Bermuda Government agreed to supply potatoes from June to August at 19/6d. per barrel cif. Trinidad.

For this purpose the Department bought potatoes from growers and shippers at 16/- per barrel (a price slightly higher than the return from Trinidad). They were fumigated with methyl bromide to destroy any tuber-moth present and were stored, until required for shipment, in the basement of the Princess Hotel which was very kindly lent by the Management. Owing to the poor quality of the potatoes there was heavy wastage in storage and in transit, particularly in the barrels, but later consignments which were sent in crates packed at the Government packing-house showed little loss.

This venture is of interest as representing the most direct action as yet taken by the Bermuda Government in the marketing of produce. By relieving the local market of over 9000 bushels of potatoes it helped the farmers over a difficult situation at no great cost to Government.

Some very fine Bermuda-grown Triumph seed was saved for the early autumn planting and, while results were variable, yields as high as 9 from 1 were recorded. This seed showed much less virus infection than did the Long Island seed, in which leaf-roll was counted to the extent of 40% of the plants. In view of similar infection in recent years the Board attempted to exclude seed potatoes from Long Island this year and only gave way under strong pressure from growers. The results proved the Board to have been right in its original stand.

Other Vegetables. The onion crop was the success of the year. Both in yield and in quality the onions were outstandingly good and owing to the fact that onions from other sources were scarce they fetched a very high price in Canada. The cold showery winter which suited the onions was too much for the celery crop, a large part of which ran to seed before reaching any size. This was disappointing as the price of this vegetable too was unusually high and a crop of average size and quality would have scored heavily. The tomato crop grown for export was also poor and very late so that little was ready in time for the Canadian market. Thanks to the existence of the cannning-plant it was possible to make good use of the tomatoes which could not be shipped. Of minor crops, water-melons and musk-melons were remarkably successful in the summer owing to the frequency of showers which allowed an unusual variety of produce to be grown.

Easter Lilies (*Lilium longiflorum*). A good crop of Easter lilies was dug, the bulbs being of fine quality and good size. Unfortunately the orders for the United Kingdom were cancelled on the eve of shipment and as a result of this the number of cases exported (1420) shows a decline from last year's total (1618). There was a keen demand in the United States for Mr. Howard Smith's early seedling lily of which 400 cases were exported.

General Outlook. In general it may be said that the industry finds itself in a sounder position at the end of the year than it did at the beginning. Both in the local market and in the Canadian market there is evidence

of increased demand and better prospects. Near at hand, the industry is likely to be profoundly affected by the erection of the United States Air and Naval Bases. The most immediate effect is the loss of valuable arable land particularly well suited to the growing of Easter lilies. Indeed more than half the present lily area will be absorbed. There is however the possibility that the establishment will provide a large and permanent market for farm produce such as fresh vegetables, milk, and eggs, so that in the long run the farming industry may profit materially.

II. WORK OF THE DEPARTMENT

The work of the Department increased significantly as a result of the war, particularly along the lines of administration, inspection, and marketing. With no increase in staff, the Department was hard pressed during much of the time and the programme of experiments and extension work was of necessity restricted.

Experimental Work. An important part of the experimental work was the testing of different varieties of vegetable crops, a number of which were varieties recommended by the Cornell Committee during their visit to Bermuda in the summer of 1939. Of several varieties of Iceberg lettuce, sown in the autumn and reaped in January, outstanding were Imperial 44 (Peter Henderson & Co.) and New York 12 (Burpee) both of which gave solid heads of medium size, and Imperial 615 (Aggeler & Musser) which gave very large solid heads maturing a few days later. In a test of sweet-corn varieties Marcross gave excellent results as an early variety, and Golden Cross Bantam and Stowell's Evergreen Hybrid succeeded equally well as later types. As a bush-bean, Tender-green was very pleasing with long straight pods of bright colour and rounded in section, in contrast to the flattened pods of the Bountiful type which is commonly grown. In observations on different tomato varieties, Valiant, a new variety from Messrs. Stokes, attracted favourable notice. Musk-melons which succeeded particularly well were the mildew-resistant Imperial 45 and the early-maturing Hearts of Gold.

Trial was made of the Willomi soybean, one of the varieties selected in Illinois for use as a vegetable, and this grew readily in the summer and gave a great yield of pods. The beans proved palatable eaten like green peas or else in dried form. Soybeans were also grown for fodder purposes and for green-manuring, and the variety Mammoth Yellow, which is commonly grown at the Agricultural Station, was surpassed in luxuriance by the variety Biloxi.

One of the great needs of the dairy industry is a large and inexpensive supply of fodder to take the place of expensive imported hay and feeding-stuffs. In the summer months there is much planting-land which is allowed to grow weeds but which could more profitably be sown with field corn, cowpeas, or soybeans for the use of cattle, and throughout the year there is idle land, formerly arable, which could grow forage grasses. A small trial which will include guinea-grass and para grass is planned.

No further progress was possible with trials of fertiliser mixtures. At present a mixture with NPK ratio of 1-2-1 is recommended by the Department for general use, and in order to save ocean-freight a concentrated formula such as 10-20-10 is advocated. Most farmers however are put off such a concentrated mixture by the high cost per bag, failing to

grasp the fact that a sparing application may be as effective as the heavy application of a less powerful mixture. Further work on sprinkler irrigation was also prevented, owing to the fact that a showery summer provided all the moisture which was necessary.

Hybridisation of types of Easter lily was continued with the object of finding a better Bermuda lily than the type now grown. The work is still far from complete but one or two lilies which promise well have been produced.

Extension Work and Crop-Reporting. Close contact was kept with farmers through frequent visits to farms by members of the Department, and at intervals systematic surveys of the main planting areas were made in order to obtain records of the various crops planted and to estimate production. Many farmers brought their problems to the Agricultural Station and advice and assistance were given wherever possible. One meeting of farmers was held during the year.

Work with the schools was advanced as far as the shortage of staff would allow. Vegetable gardens were planted by about half the schools and interest was increased by a competition sponsored by the Garden Club for the best school-garden. The first prize went to Warwick Academy, the second was shared by the Central School and the West End School, and the next was earned equally by the St. David's School and the Gilbert Institute. Senior boys of the Central School competed for prizes for the best vegetable plot kept by the boy at his home, and these home-gardens were judged by the Director. Visits were paid to the Agricultural Station by parties of children from several schools and instruction was given on economic plants and on the work in progress.

Assistance was given to the Warwick Food Production Committee in its exhibition and also to the Annual show at Somerset both of which were a great success. At both, exhibits on food production were displayed by the Department. Help was given in the organising of a poultry show in St. Georges, the first held at the east end for many years, and a poultry and rabbit show in Hamilton. Talks were given by members of the Department to Arbor Societies and Garden Clubs. Assistance was given to nutrition committees in some of the parishes in arranging lectures on the bottling and canning of vegetables. A large quantity of jars for bottling vegetables was imported by the Department for sale to housewives at cost and a few small home-canning units were lent.

The allotments provided by the Department in Devonshire North have been popular and on the whole have been put to good profit. If greater supervision and instruction can be given in future years the use of allotments may be extended to great advantage.

Plant Pathology. The Plant Pathologist reports no unusual loss of crops from disease and pest with the exception of wastage of the large potato crop dug in May. Decay seemed associated with the late date of digging much of the crop, the temperature of the soil being then high. Some Phytophthora rot was also present and attack by tuber-moth, *Phthorimaea operculella* set in very severely on potatoes in storage and in some cases even on potatoes in the field. Its control was made a major project. Equipment for fumigation by methyl bromide was obtained and all potatoes for export after a certain date were fumigated as well as many of the potatoes for local use. Fumigation was done either

in the small chamber at the Agricultural Station or under special tarpaulins of which the larger size measuring 40 feet square was able to accommodate 700 bushels of potatoes. A tin containing liquid methyl bromide was placed in a special applicator and when all was ready a cap was screwed tight, which pierced the tin and caused the methyl bromide to be liberated and to pass into a fumigating chamber in the form of gas. An electric fan placed in the chamber ensured circulation of the gas. At the rate of 2 lbs. of methyl bromide per cubic foot capacity for two hours, a complete kill was obtained without injury to the tubers. Whilst the properly equipped fumigating chamber was the most convenient to use, the special tarpaulins proved valuable since they enabled fumigation to be done on farms or at places where potatoes were to be stored and where there was often not a building suitable for fumigating. For the better storage of potatoes in future seasons the following precautions are recommended:— (1) the seed to be planted early and certainly not later than the middle of February; (2) adequate spraying to protect against blight and insect attack on the foliage; (3) proper cultivation to control tuber-moth, including thorough earthing-up of the potatoes in the rows; (4) the crop to be harvested promptly so that tubers are not exposed to tuber-moth or to spores from blighted foliage.

Successful results were obtained in a preliminary trial of "Brytene" wax emulsions on beets, carrots, and turnips. The appearance and keeping-quality of carrots in particular were enhanced and a slight reduction in attack by the fungus *Sclerotinia sclerotiorum* was noted. Copper citrate incorporated in the wax emulsion did not significantly reduce fungal attack. The chief difficulty met was the length of time which the produce took to dry after being dipped in the wax solution, presumably due to high atmospheric humidity. If this process is to be used commercially, special drying-equipment will be necessary.

The customary inspection services were maintained against foreign diseases and pests and special precautions were taken against Japanese Beetle, *Popillia japonica.* One adult beetle was captured in a garden in St. Georges on 1st June, but a thorough search of the area failed to reveal others. No other specimens were seen till eight weeks later when, on arrival of a steamship from New York; one beetle was taken on a mail-bag and one on the deck of the ship. Public vigilance remained as keen as in the previous year, thanks to suitable publicity, and it is thought unlikely that any number of beetles arrived undetected. One specimen of the Colorado Potato Beetle *Leptinotarsa decemlineata* was taken on potatoes imported from Canada.

On account of heavy virus infection of seed potatoes from Long Island in recent years, an attempt was made by the Plant Pathologist and Agricultural Assistant to grow equally good seed potatoes locally. Bliss Triumph seed from Nova Scotia was planted in February and as the plants grew they were inspected for virus infection and diseased plants were removed. The potatoes were dug towards the end of May and placed in cold storage till required for planting as seed in September. The crop which resulted proved remarkably free from disease, only 3.7% of the plants being infected with leaf-roll. Seed from fields from which diseased plants had not been removed showed 17% infection, whereas seed imported from Long Island was infected to the extent of 40%. In this case the yield from the Bermuda-grown seed was far above that from the imported. Less satisfactory results followed from Bermuda-grown seed which was reaped as

early as February and was placed in cold storage from April to September. This seed gave plants lacking in vigour which died prematurely and yielded poorly.

Fungous diseases of special interest recorded on fruit-trees of various kinds during the year included a rot of the sterile flowers and fruit of the Dwarf Cavendish banana by *Sclerotinia sclerotiorum* (Lib.) de Bary; a leaf-spot of Guava due to *Gloeosporium Psidii* Delacr; scab disease of grape-fruit caused by *Sphaceloma Fawcettii,* Jenkins; and leaf-curl of peach by *Taphrina deformans* (Berk) Tul. Other diseases recognised for the first time were grain-smut *Sphacelotheca Sorghi* (Lk) Clinton on *Sorghum vulgare;* and leaf-spot of peanut due to *Cercospora personata* (B. & C.) Ell & Ev. A fungus causing decay of cassava tubers was isolated and identified as *Diplodia Theobromae* (Pat) Nowell. The Plant Pathologist collaborated with Dr. Fred J. Seaver of the New York Botanic Garden in his continued studies of the fungal flora of Bermuda.

Insect pests to attract attention included the long-horned beetle *Leptostylus praemorsus* F., which severely injured grapefruit, lemon, and lime trees by tunnelling under the bark. It was already known as a pest of ornamental trees and Bermuda cedar, but its attack on citrus had not hitherto been recognised.

Marketing Services and Investigations. Early in the year a visit was paid to Eastern Canada by the Agricultural Assistant to survey prospects for the season. As a result it was possible to advise growers what crops should be grown for the Canadian market. Towards the time of shipping, as it was not possible to publish in advance the sailing of steamships, arrangements were made by the Department to inform representative farmers when the crops should be prepared for shipment and these farmers relayed the information to others in their neighbourhood. This system worked fairly well. The Department kept in close touch with the representative brokers and marketing information was promptly passed on to shippers and growers.

The possibilities of extending the market for produce in the West Indies were fully explored both by correspondence and by visits of members of the Board. The Chairman visited Trinidad in May to complete arrangements for the sale of potatoes during the summer and Messrs. Gorham and Pearman visited British Guiana, Trinidad, Barbados and the Windward and Leeward Islands late in the autumn surveying the markets in detail.

An effort was made to stimulate the sales of Bermuda Triumph potatoes in New York for Thanksgiving and Christmas. For Thanksgiving shipments were confined to one broker in New York and high-class hotels, club, and restaurants were informed when new Bermuda potatoes would be in the market and where they could be obtained. This effort proved a failure, for although only one-fourth of the expected shipment went forward, this was sold with difficulty at unremunerative prices.

Inspection Services and Government-Packing of Vegetables. The irregularity of steamship sailings to Canada and the short notice of their arrival made it more difficult than usual to pack vegetables centrally. In the case of vegetables which could conveniently be packed by hand, growers were advised to pack them on the farm. Approximately one-sixth of the produce shipped to Canada consisting chiefly of tomatoes, potatoes and

cabbage were graded and packed at the Government Packing-House, the cost being borne by the growers. The greater part of the potatoes shipped to Trinidad under the Government marketing scheme was graded and packed at the Packing-House at Government expense.

The same shipping conditions made inspection of produce on the dock much more difficult than usual. Some growers in order to make sure of an anticipated sailing reaped their produce too soon so that wastage tended to occur before shipment, for which careful inspection was necessary. Others having short warning of the sailing of a ship rushed their produce to the dock at the last opportunity so that the inspectors had to examine a large quantity of produce in a very short time. The inspection staff deserves commendation for the work which they did in face of these difficulties. A total of 2130 packages, representing 5% of the crates packed on the farm, was rejected as unfit for shipment, but most of the condemned produce on being picked over and re-packed was passed for export.

Marketing of Eggs. The grading and marketing of eggs initiated in the Spring of 1939 was continued and extended during 1940. The production of eggs reached a large volume early in the year and soon out-ran the consumption. All eggs of suitable standard were accepted at the Agricultural Station and were tested, graded, and packed. Sales were made through a commission agent on a cash basis and the suppliers were paid for their eggs usually within a few days. Eggs which could not be sold immediately were placed in cold storage until the demand caught up with the supply, and, in the case of such eggs, payment was deferred until the sale was made. In this way any wastage of surplus eggs during the peak of production was prevented and local eggs were able to fill the whole demands of the local market for more than six months. A total of 14,993 dozen was packed and the average price paid to the supplier was 1/11d. per dozen.

Canning Plant. A recommendation of the Food & Supplies Control Board that a plant be constructed for canning vegetables was approved by the Legislature late in 1939. The project was placed in the hands of the Board of Agriculture and a small Canning Committee was appointed consisting of Messrs. C. M. Allen and J. E. Pearman. The success of the first year's operation was in large part due to the very capable planning and hard work of this committee. Valuable assistance was given by Mr. W. S. Macklem, Vice-President of Messrs. Curtice Bros. Rochester, N.Y., who visited Bermuda for four weeks at invitation of the Government and did much to ensure a good start. It was decided to use a simple inexpensive plant of the type used elsewhere for community canning. Tanks for the necessary water-supply and a small stone building to house the plant were constructed at the Agricultural Station by unemployed labour enlisted in the Bermuda Service Corps. Equipment consisting of three small retorts with individual petrol burners, a small machine for sealing cans, an electric water-heater and a hot-plate, tubs and heaters for blanching vegetables, tables, shelves, and utensils cost approximately £320. The staff consisted of a woman-supervisor, a mechanic in charge of retorts and sealing-machine, and two men and several women preparing vegetables and storing the product, with which staff a maximum output of 1200 cans was reached in an ordinary day's run. For the first three weeks the plant was fortunate in having Miss Wilson the instructor at the Domestic Science Training Centre as supervisor, and she also proved invaluable in finding a suitable staff.

Arrangements for the supply of vegetables were made by the Department. A small part of the supply was grown especially for canning, seed being given to the grower, but for the greater part the plant depended upon what the farmers had to offer. The resulting uncertainty and irregularity of supply upset the proper working of the plant and for most efficient running the required quantity of vegetables should be planted specifically for canning. The plant was open from the beginning of April to the end of July except for two short intervals, and carrots, beets, string beans, tomatoes and tomato juice were canned in turn. Cans of No. 2 size (20 ozs.) were used and a total of 2780 cases of 24 cans each was packed. Nearly half of this quantity had been sold by the end of the year. Some difficulty was experienced through loss of colour in beets, but apart from this the quality of the product was excellent. The average cost of production was 6.36d. per tin. At this price the venture, though justified as a war measure, would not be an economic proposition in times of peace. Improvements for next season aim at increasing the daily output and lowering the cost of production.

Horticulture. From 22nd January to 30th October the Horticulturist was seconded for duty with the Bermuda Service Corps in one of the chief projects of their relief work, the construction of a large park at the western end of Pembroke Marsh. This was barely completed by the end of the year but already the large area which had previously been a refuse dump was looking green and attractive. Nearly two thousand plants were supplied from the Agricultural Station for this park and others were obtained from the Trinidad Department of Agriculture and from the late Mr. J. D. C. Darrell.

From the beginning of the year the Department became responsible for the up-keep of Government House Grounds and many improvements were made to the gardens. During the year the Department was placed in charge also of the small piece of land at the Foot of the Lane in Paget which is being kept as an ornamental park.

Progress was made with the programme of fruit-production. Several good types of papaw were raised from seed, obtained through the kindness of Mr. A. W. West, and the Director of Agriculture, Trinidad, and some two thousand plants were given away. The Department is indebted also to Mr. A. A. Watts for a generous gift of budwood of four outstanding varieties of loquat: Advance, Champagne, Early Red and Thales. This was sent from California and was used to bud over a hundred seedling plants growing at the Station. These in their turn will supply stock for many more plants, so that large quantities of these improved types should soon be available in Bermuda. A few guava plants were obtained from Trinidad for propagation purposes and other fruits imported for trial included six grape varieties of Concord and Muscadine type, two varieties of fig and one of plum obtained from Florida.

Veterinary Work. No epidemic of notifiable disease occurred amongst livestock during the year. Tests of cattle for tuberculosis made by the Government Veterinary Officer numbered 1485, an increase of 247 over the tests made in 1939. The number of positive reactors was 29 as against 28 in 1939. Amongst cattle slaughtered for beef, three carcases were condemned as showing tubercular lesions, or three less than in the previous year. One cow infected with Actinomycosis and seven badly infected with Bang's Disease were destroyed, compensation being paid in conformity with the regulations. The incidence of Bang's Disease attracted

much attention and many blood-tests were made by the Government Veterinary Officer with the co-operation of the Pathologist at the Hospital. All domestic animals landed in the Colony were examined for disease and were kept under observation for some time where necessary. There was a marked decline in the number of importations, horses totalling 16 (115 in 1939), cattle 0 (22), pigs 25 (33), goats 0 (5), poultry 8,308 (23,628), dogs 116 (223).

Office Work and Publications. The clerical work, including correspondence on agricultural and departmental matters, the keeping of financial accounts, and the keeping of records in connection with shipment and marketing of produce, was efficiently performed. Eight numbers of the Agricultural Bulletin were published and a popular leaflet "Hints on Growing Vegetables" was entirely re-written and was distributed locally. A list of 50 insects recorded since publication of Ogilvie's "Insects of Bermuda" was compiled by the Plant Pathologist and was printed.

The Agricultural Station. The ornamental grounds were kept in good order throughout the year. A great improvement was effected on the South Bank where a row of fiddlewood trees was taken out and replaced by a planting of decorative trees and shrubs. The experimental plots were fully occupied by vegetables and other crops, most of which were grown for varietal tests or for marketing investigations. Part of the produce was supplied to the Hospital without charge, some was sold in the local market at times when it did not harmfully compete with produce of the farms, and some was used in the canning-plant. The livestock was reduced as an economy measure and at the end of the year comprised 2 pure-bred Guernsey bulls, one cow and a heifer, and one boar and one sow. Early in the year many rabbits of Flemish Giant Breed were raised at the station and were distributed for food production purposes.

Board of Agriculture. Meetings of the Board of Agriculture were held during the year and were attended by the Director as technical adviser. In addition committees dealing with marketing, canning, cold storage, and the milk industry met on numerous occasions. The Director was a member of the Food & Supplies Control Board throughout the year.

Acknowledgements. Grateful thanks are due to many individuals and institutions, too numerous to mention by name, who sent planting material and publications and technical assistance. It is a pleasure once more to record the loyal work of officers of the Department which was made more difficult than usual by shortage of staff and by exaggerated criticism.

Respectfully submitted,

T. A. RUSSELL,

Director of Agriculture.

3rd February 1941.

Board of Agriculture, 1940.

Sir S. S. Spurling, Kt., C.M.G., O.B.E., M.C.P., Chairman.
Mr. J. E. P. Vesey, M.C.P., Deputy-Chairman
Mr. A. J. Gorham
Mr. A. C. Benevides
Mr. J. H. Hollis
Wor. B. C. C. Outerbridge, J.P., M.C.P.
Mr. C. M. Allen
Mr. J. E. Pearman.

Department of Agriculture, 1940.

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